IN THE CLAIMS:

1. (Currently Amended) A method for ~~deciphering an~~ providing alignment ~~feature~~ for semiconductor fabrication, comprising the steps of:

providing an alignment feature on a semiconductor wafer having an elasticity that is different from material surrounding the feature;

applying stress to the wafer; ~~and~~

scanning the semiconductor wafer ~~feature~~ with an atomic force microscope to measure stress fields caused by the applied stress to determine a position of the alignment feature based on the elasticity difference between the alignment feature and the material surrounding the feature; and

using the determined position of the alignment feature for aligning a mark.

2. (Original) The method as recited in claim 1, wherein the step of applying stress to the wafer includes the step of applying acoustic energy to the wafer.

3. (Original) The method as recited in claim 1, wherein the acoustic energy includes ultrasonic energy.

4. (Original) The method as recited in claim 1, wherein the atomic force microscope includes a cantilever tip and the step of applying stress to the wafer includes vibrating the cantilever tip.

5. (Currently Amended) The method as recited in claim 1, further comprising the step of determining an approximate location of the alignment feature by employing an optical method.

6. (Original) The method as recited in claim 5, wherein the optical method includes employing a pattern recognition method.

7. (Currently Amended) The method as recited in claim 1, ~~further comprising the step of~~ wherein the step of using the determined position of the alignment feature for aligning a mark comprises aligning a bullet mark on a mask to the alignment feature.

8. (Original) The method as recited in claim 7, wherein the step of aligning provides an alignment resolution of less than 20 nm.

9. (Currently Amended) A system for aligning a pattern to a semiconductor wafer, comprising:

an alignment feature formed on the wafer, the alignment feature including an elasticity that is different from material surrounding the alignment feature;

an acoustic source which directs an acoustic beam on the surface of the wafer to apply stress to the wafer; and

an atomic force microscope having a tip, the tip for scanning the wafer ~~feature~~ to measure stress fields caused by the applied stress to determine a position of the alignment feature based on an elasticity difference detected between the alignment feature and the material surrounding

the alignment feature, wherein the determined position of the alignment feature is used for alignment.

10. (Original) The system as recited in claim 9, wherein the acoustic source includes an ultrasonic energy source.

11. (Currently Amended) The system as recited in claim 9, further comprising an optical system for determining an approximate location of the alignment feature.

12. (Currently Amended) The system as recited in claim 11, wherein the optical system includes a pattern recognition program to decipher an area where the alignment feature is located.

13. (Currently Amended) The system as recited in claim 9, wherein the alignment feature includes a portion of a functional component of a semiconductor device.

14. (Currently Amended) The system as recited in claim 9, further comprising a stage for aligning a mask with the alignment feature on the wafer in accordance with information collected by the atomic force microscope.

15. (Original) The system as recited in claim 9, wherein the system provides an alignment resolution of less than 20 nm.

16. (Currently Amended) A system for aligning a pattern to a semiconductor wafer, comprising:

an alignment feature formed on the wafer, the alignment feature including an elasticity that is different from material surrounding the feature;

an atomic force microscope having a cantilevered tip; and

an acoustic transmitter coupled to the cantilevered tip to apply acoustical energy to the wafer by vibrating the cantilever tip such that the cantilevered tip scans the wafer ~~feature~~ to determine a position of the alignment feature based on the elasticity difference between the alignment feature and the material surrounding the alignment feature, wherein the determined position of the alignment feature is used for alignment.

17. (Currently Amended) The system as recited in claim 16, further comprising an optical system for determining an approximate location of the alignment feature.

18. (Currently Amended) The system as recited in claim 17, wherein the optical system includes a pattern recognition program to decipher an area where the alignment feature is located.

19. (Currently Amended) The system as recited in claim 16, wherein the alignment feature includes a portion of a functional component of a semiconductor device.

20. (Currently Amended) The system as recited in claim 16, further comprising a stage for aligning a mask with the alignment feature on the wafer in accordance with information collected by the atomic force microscope.

21. (Original) The system as recited in claim 16, wherein the system provides an alignment resolution of less than 20 nm.